

**MONTANA DEPARTMENT OF ENVIRONMENTAL QUALITY
WATER QUALITY DIVISION
MONTANA POLLUTANT DISCHARGE ELIMINATION SYSTEM
(MPDES)**

Fact Sheet

Permittee: Town of Chester

Permit No.: MT0020338

Receiving Water: Cottonwood Creek

Facility Information:

Name Town of Chester Wastewater Treatment Facility

Location 48.50512 N, 110.96160 W
Chester, MT 59522
Liberty County

Facility Contact Terry Tyler, Public Water Director
P.O. Box 644
Chester, MT 59522

Fee Information:

Number of Outfalls 1

Outfall – Type 001 – Minor Publicly-Owned Treatment Works

I. Background

A. Permit Status

This fact sheet has been drafted for renewal of Montana Pollutant Discharge Elimination System (MPDES) permit number MT0020338 for the Town of Chester Wastewater Treatment Facility (WWTF). The previous permit was issued on January 1, 2018 and was set to expire on December 31, 2022 (2018-issued permit), but the Montana Department of Environmental Quality (DEQ) received an MPDES permit renewal application on July 15, 2022 and DEQ administratively extended the permit on October 3, 2022.

B. Description of Facility and Discharge Point

The existing WWTF is a three-cell facultative lagoon constructed in 1984 to replace a single-lagoon built in the early 1950's.

Effluent is discharged to Cottonwood Creek, a tributary of the Marias River. The outfall (Outfall 001) is located at approximately latitude 48.50078 N, longitude 110.96181 W. A Parshall flume is used to measure effluent flow rate. Self-monitoring samples are collected just before the Parshall flume. Details are summarized in **Attachment 1**.

The system is 14.3 total acres designed to have 180 days detention time. Two primary cells (3.9 acres each) have 80-day detention times each, while the final cell (6.5 acres) has a 100-day detention. Discharge from the facility is controlled. The average daily design flow is 0.168 million gallons per day (mgd). Design criteria are summarized in **Table 1**.

Table 1: Current Design Criteria Summary⁽¹⁾

Facility Description: Three-cell facultative lagoon system, periodic discharge to Cottonwood Creek	
Permit Number: MT0020338	Facility Name: Town of Chester Wastewater Treatment Facility
Facility Description: Three-celled facultative lagoon system with batch discharge	
Construction Date: 1984	Design Year:
Design Population: 1,130	Current Population: 840 ⁽²⁾
Design Flow, Average (mgd): 0.168	Design Detention Time: 180 days
Primary Cells: 2	Secondary Cells: 1
Design BOD ₅ Removal (%): unknown	Design BOD ₅ Load (lb/day): 228
Design TSS Removal (%): unknown	Design TSS Load (lb/day): unknown
Estimated I/I: 5,000 gpd ⁽²⁾	Disinfection: None
Footnote: (1) Information obtained from Damschen and Associates. 1985. <i>Operation and Maintenance Manual Treatment Ponds: Town of Chester EPA Project no. C300249-94</i> unless otherwise noted. (2) 2022 MPDES Application Form	

C. Existing Permit Requirements and Effluent Quality

Effluent characteristic data reported on Discharge Monitoring Reports (DMR) by Chester WWTF for the period of record (POR) from July 2017 through June 2022 is summarized in **Table 2**.

Table 2: Effluent Characteristics Based on Outfall 001 Discharge Monitoring Reports – July 2017 Through June 2022							
Parameter	Sample Location	Units	2018 Permit Limit ⁽¹⁾	Minimum Value	Maximum Value	Average Value	Number of Samples
Flow, Daily Average	Effluent	mgd	(2)	0.06	0.13	0.08	26
Duration of Discharge	Effluent	days/month	(2)	9	31	23.6	26
5-Day Biochemical Oxygen Demand (BOD ₅)	Influent	Concentration (mg/L)	(2)	120	1,600	308	26
	Effluent	Concentration (mg/L)	45/65	6	85	23.0	26
	NA	Percent Removal	65	78	98	93	26
	Effluent	Load (lbs/day)	63/91	3.9	51	16.0	26
Total Suspended solids (TSS)	Influent	Concentration (mg/L)	(2)	70	772	278	26
	Effluent	Concentration (mg/L)	45/65	8.3	119	26.2	26
	NA	Percent Removal	65	74.6	98	91	26
	Effluent	Load (lbs/day)	63/91	3.9	85.9	19.4	26
pH	Effluent	Standard Units (s.u.)	6.0-9.0	8.0	8.8	8.5	26
Footnotes:							
(1) Average monthly limit/average weekly limit							
(2) No limit in 2018 permit; monitoring requirement only							

D. Compliance History

An inspection was performed on June 21, 2022 and found no violations.

II. Effluent Limitations

A. Technology-Based Effluent Limits

1. Applicability

Federal regulations define minimum treatment requirements for secondary treatment, or the equivalent, for publicly owned treatment works (POTWs). Secondary treatment is defined in terms of effluent quality as measured by pH, 5-day biochemical oxygen demand (BOD₅), total suspended solids (TSS), and percent removal of BOD₅ and TSS [40 (Code of Federal Regulations) CFR 133].

The secondary standard treatment requirement may be modified on a case-by-case basis for facilities that are eligible for treatment equivalent to secondary (TES) for BOD₅, TSS and percent removal of

BOD₅ and TSS. To determine if a facility is eligible for treatment equivalent to secondary (TES), the facility must meet the requirements summarized as follows:

- 1) The 95th percentile of the 30-day BOD₅ and TSS concentrations in a minimum 2-year period, excluding upsets, bypasses, operational errors and unusual conditions exceed the minimum levels established for secondary treatment requirement;
- 2) The treatment works utilize a trickling filter or waste stabilization pond; and,
- 3) The treatment works utilizes biological treatment that consistently achieves a 30-day average of at least 65 percent removal of BOD₅.

For the 2011-issued permit, DEQ determined Chester WWTF to be a waste stabilization pond that consistently achieved at least 65% removal for both BOD₅ and TSS as well as the average monthly concentrations of 45 mg/L for BOD₅ and TSS. For this reason, technology-based effluent limits (TBELs) were based on TES. During the current renewal, the Town of Chester continued to meet the TES monthly average requirements for BOD₅ and TSS. The Town of Chester was found not to be eligible for further adjustment.

The proposed TBELs found in **Table 4** are based on treatment equivalent to secondary, and remain unchanged from the 2011-issued permit cycle.

2. *Mass-based Effluent Limitations*

Effluent limits must be expressed in terms of mass (mass/time), except for certain conditions, such as pH, temperature, and other pollutants that cannot appropriately be expressed by mass. For municipal treatment plants, mass-based limits are based on the average daily design flow for the facility.

The mass-based limits, identified as load, for the Chester WWTF are calculated as follows:

$$\text{load} \left(\frac{\text{lbs}}{\text{day}} \right) = \text{avg daily design flow (mgd)} \times \text{concentration} \left(\frac{\text{mg}}{\text{L}} \right) \times 8.34 \frac{\text{lb} \cdot \text{L}}{\text{Mgal} \cdot \text{mg}}$$

BOD₅ Mass-based Limits:

$$\text{average monthly load} = 0.168 \text{ mgd} \times 45 \frac{\text{mg}}{\text{L}} \times 8.34 \frac{\text{lb} \cdot \text{L}}{\text{Mgal} \cdot \text{mg}} = 63 \frac{\text{lbs}}{\text{day}}$$

$$\text{average weekly load} = 0.168 \text{ mgd} \times 65 \frac{\text{mg}}{\text{L}} \times 8.34 \frac{\text{lb} \cdot \text{L}}{\text{Mgal} \cdot \text{mg}} = 91 \frac{\text{lbs}}{\text{day}}$$

TSS Mass-based Limits:

$$\text{average monthly load} = 0.168 \text{ mgd} \times 45 \frac{\text{mg}}{\text{L}} \times 8.34 \frac{\text{lb} \cdot \text{L}}{\text{Mgal} \cdot \text{mg}} = 63 \frac{\text{lbs}}{\text{day}}$$

$$\text{average weekly load} = 0.168 \text{ mgd} \times 65 \frac{\text{mg}}{\text{L}} \times 8.34 \frac{\text{lb} \cdot \text{L}}{\text{Mgal} \cdot \text{mg}} = 91 \frac{\text{lbs}}{\text{day}}$$

Where:

mgd = million gallons per day

mg/L = concentration in milligrams per liter

Mgal = million gallons

mg = milligrams

$8.34 \frac{\text{lb} \cdot \text{L}}{\text{Mgal} \cdot \text{mg}}$ = conversion factor relating mass of water to flow

3. Nondegradation Load Allocations

This permit is not for a new or increased source. Nondegradation load allocations calculated in the 2018-issued permit cycle are presented in **Table 3** for BOD₅ and TSS in the effluent. These values define baseline allocated loads for the wastewater treatment facility and any increases above these amounts are subject to the provisions of Montana's Nondegradation Policy.

Actual discharge loads from self-monitoring data were calculated and are compared to the nondegradation loads in **Table 3**. The permit does not authorize a new or increased discharge, and therefore is not subject to Montana's Nondegradation Policy. Monthly average loading limits for the technology-based parameters of concern are equivalent to the more stringent of nondegradation allocations or the mass-based loading limits calculated in **Table 3**.

Table 3: Calculated Nondegradation Allocated and Actual Annual Loads							
Parameter	Allocated Load (lb/day)	Actual Average Monthly Loads (lb/day)					
		2017	2018	2019	2020	2021	2022
BOD ₅	63	22.8	17.9	12.3	17.4	12.5	14.6
TSS	63	18.4	17.6	20.7	16.0	18.8	27.2

4. Proposed Technology-Based Effluent Limitations

Table 4: Outfall 001 Proposed Technology-Based Effluent Limits			
Parameter	Units	Average Monthly Limit	Average Weekly Limit
5-Day Biochemical Oxygen Demand	Concentration (mg/L)	45	65
	Load (lbs/day)	63	91
	Percent Removal	65 ⁽¹⁾	--
Total Suspended Solids	Concentration (mg/L)	45	65
	Load (lbs/day)	63	91
	Percent Removal	65 ⁽¹⁾	--
pH	s.u.	6.0-9.0 (instantaneous)	
Footnotes:			
(1) The arithmetic mean of the values for BOD ₅ or TSS for effluent samples collected in a period of 30 consecutive days shall not exceed 35% of the arithmetic mean of the values for influent samples collected at approximately the same time during the same period (65% removal).			

B. Water Quality-Based Effluent Limits

1. Scope and Authority

Permits are required to include water quality-based effluent limits (WQBELs) when technology-based effluent limits are not adequate to protect state water quality standards. Montana water quality standards require that no wastes may be discharged that can reasonably be expected to violate any

state water quality standards. Montana water quality standards also define both water use classifications for all state waters and numeric and narrative standards that protect those designated uses.

2. Receiving Water

Cottonwood Creek is the receiving water for the Town of Chester wastewater discharge. This stream is characterized by the U.S. Geological Survey (USGS) as an ephemeral tributary to the Marias River, which is identified as Hydrological Unit Code (HUC) 10030203. The USGS water resources database does not contain data for this stream. The water use classification for the Marias River and its tributaries is B-2. Waters classified as B-2 are to be maintained suitable for drinking, culinary and food processing purposes, after conventional treatment; bathing, swimming, and recreation; growth and marginal propagation of salmonid fishes and associated aquatic life, waterfowl and furbearers; and agricultural and industrial water supply.

Cottonwood Creek is not listed on Montana's 2020 Integrated Report and 303(d) list of impaired waters.

DEQ considers Cottonwood Creek in the vicinity of Chester as an ephemeral stream. The stream flows only in response to precipitation or snowmelt in the immediate watershed and the channel bottom is always above the local water table. Evidence for this conclusion was provided by the 2009 *Cottonwood Creek Stream Status Study*, a report prepared by Oasis Environmental for the Town of Chester and Robert Peccia & Associates, Inc. The report characterized Cottonwood Creek as ephemeral, and established its conclusions on ground water monitoring data and numerous observations during 2008 and 2009.

3. Mixing Zones

The permittee did not request a mixing zone. The discharge is to an ephemeral stream, therefore a mixing zone is not granted. All effluent limits apply end-of-pipe.

4. Determining the Need for WQBELs

Permits are typically required to include WQBELs when technology-based effluent limits are not adequate to protect water quality standards. Because the effluent discharge is intermittent and the ephemeral creek runs for approximately 25 miles prior to connecting to a perennial river, Marias, DEQ is not including water quality based effluent limits. DEQ anticipates the effluent to infiltrate prior to reaching the near perennial water body, and therefore does not have reasonable potential to cause or contribute an exceedance of water quality standards.

No water quality-based effluent limits are proposed for this permit cycle.

C. Final Proposed Effluent Limitations

Effluent limitations or conditions in reissued permits must be at least as stringent as those in the existing permit, with certain exceptions. Also, permits contain the more stringent TBEL or WQBEL limitation applicable to an individual pollutant. DEQ considered the proposed permit limits to ensure that they were as stringent as previous limits, or met the nondegradation requirements.

Beginning on the effective date and lasting through the term of the permit, the discharge from Outfall 001 shall meet the effluent limits presented in **Table 5**:

Table 5: Outfall 001 Proposed Effluent Limits			
Parameter	Units	Effluent Limitations ⁽¹⁾	
		Average Monthly Limit	Average Weekly Limit
5-Day Biochemical Oxygen Demand	Concentration (mg/L)	45	65
	Load (lbs/day)	63	91
	Percent Removal	65% ⁽²⁾	--
Total Suspended Solids	Concentration (mg/L)	45	65
	Load (lbs/day)	63	91
	Percent Removal	65% ⁽²⁾	--
pH ⁽³⁾	(s.u.)	6.0-9.0 (instantaneous)	
Footnotes:			
(1) See definitions in the permit.			
(2) The arithmetic mean of the values for BOD ₅ or TSS for effluent samples collected in a period of 30 consecutive days shall not exceed 35% of the arithmetic mean of the values for influent samples collected at approximately the same time during the same period (65% removal).			
(3) Effluent pH shall remain between 6.0 and 9.0 (instantaneous minimum and maximum). For compliance purposes, any single analysis and/or measurement beyond this limitation shall be considered a violation of the conditions of this permit.			

There shall be no discharge of floating solids or visible foam in other than trace amounts.

There shall be no discharge which causes visible oil sheen in the receiving stream.

There shall be no discharge that settles to form objectionable sludge deposits or emulsions beneath the surface of the water or upon adjoining shorelines.

III. Monitoring and Reporting Requirements

A. Requirement to Monitor and Report

Monitoring and reporting establish an ongoing record of the permittee's compliance status as well as a data set that is representative of the permitted activity. All analytical procedures must comply with the specifications of 40 CFR Part 136 and the analyses must meet any Required Reporting Values listed in Circular DEQ-7 unless otherwise specified. Samples shall be collected, preserved and analyzed in accordance with approved procedures listed in 40 CFR Part 136.

Reporting frequency shall be monthly, and each facility must submit the results on their NetDMR for each month by the 28th of the following month. If no discharge occurs during the reporting period, "no discharge" shall be reported on the NetDMR.

B. Monitoring Locations, Frequency, Sample Type, and Calculations

Discharge from the facility is controlled and variable. The permittee will be required to monitor effluent flow, BOD₅, TSS, and pH weekly during periods with discharge. A logbook will be kept to record discharge start and end dates, as well as the measured discharge rates.

Monitoring of wastewater effluent will be conducted at the discharge structure. Samples will be collected at the Parshall flume and will reflect the nature of the discharge. Details are shown in **Table 6**.

Influent monitoring is needed to calculate percent removal for BOD₅ and TSS. Monthly sampling of wastewater at the influent structure must be performed only during months when effluent discharge occurs. The influent structure is located on the north end of the lagoons. Details are shown in **Table 6**.

Table 6: Monitoring and Reporting Requirements						
Parameter	Monitoring Location	Units	Sample Type ⁽¹⁾	Minimum Sample Frequency ⁽²⁾	Reporting Metric ⁽³⁾⁽⁴⁾	Required Reporting Value
Flow	Effluent	mgd	Instantaneous	Weekly	Daily Maximum, Monthly Average	NA
	Duration of Discharge	days/month	Calculated	Continuous	Total	NA
5-Day Biochemical Oxygen Demand (BOD ₅)	Influent	Concentration (mg/L)	Grab	Monthly	Monthly Average	10
	Effluent	Concentration (mg/L)	Grab	Weekly	Weekly Average, Monthly Average	
	NA	Percent Removal ⁽⁵⁾	Calculated	Monthly	Monthly Average	
	Effluent	Load (lbs/day)	Calculated	Monthly	Weekly Average, Monthly Average	
Total Suspended Solids (TSS)	Influent	Concentration (mg/L)	Grab	Monthly	Monthly Average	10
	Effluent	Concentration (mg/L)	Grab	Weekly	Weekly Average, Monthly Average	
	NA	Percent Removal ⁽⁵⁾	Calculated	Monthly	Monthly Average	
	Effluent	Load (lbs/day)	Calculated	Monthly	Weekly Average, Monthly Average	
pH	Effluent	s.u.	Instantaneous	Weekly	Maximum, Minimum	0.1

Footnotes: NA=Not applicable

(1) See Definition section at end of permit for explanation of terms.

(2) Monitoring required during periods with discharge.

(3) If only one sample is collected then it is considered the monthly average and reported on the Discharge Monitoring Report.

(4) If only one sample is collected during the calendar week it is considered the weekly average. The highest weekly average of the monitoring period shall be reported as the maximum weekly average on the Discharge Monitoring Report. In cases where only one sample is collected during the entire monitoring period, that sample shall be reported as both the monthly average and maximum weekly average.

(5) Percent removal shall be calculated using the monthly average values.

1. Load Calculations

In addition to reporting the concentration values, the load, expressed in lbs/day, must be calculated weekly for BOD₅ and TSS. The effluent flow rate at the time of sample collection will be used in the load calculation as well as the parameter concentration as demonstrated in the following equation:

$$\begin{aligned}
 \text{Load} &= \text{Effluent Flow Rate (Actual)} \times \text{Parameter Concentration} \times \text{Conversion Factor} \\
 &= \text{mgd} \times \frac{\text{mg}}{\text{L}} \times 8.34 \frac{\text{lb} \cdot \text{L}}{\text{Mgal} \cdot \text{mg}} = \frac{\text{lbs}}{\text{day}}
 \end{aligned}$$

Where:

mgd = million gallons per day
 mg/L = concentration in milligrams per liter
 Mgal = million gallons
 mg = milligrams

$8.34 \text{ (lb}\cdot\text{L)} / (\text{Mgal}\cdot\text{mg}) = \text{conversion factor relating mass of water to flow}$

The weekly average load reported on the DMR shall be the highest weekly load calculated. The monthly average load reported on the DMR shall be the average of all the weekly loads.

2. Removal Efficiency

The percent removal shall be calculated using the following formula:

$$\text{percent removal} = \frac{[\text{influent concentration}] - [\text{effluent concentration}]}{[\text{influent concentration}]} \times 100$$

Where:

Influent Concentration = Corresponding monthly average influent concentration based on the analytical results of the reporting period

Effluent Concentration = Corresponding monthly average influent concentration based on the analytical results of the reporting period

IV. Special Conditions

A. Lagoon Operation and Maintenance Requirements

A permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of the permit. A wastewater treatment system must have an Operation and Maintenance (O&M) manual developed at the time of construction and/or upgrade. Each permitted facility is required to:

1. Maintain an up-to-date O&M manual;
2. Follow the procedures in the O&M manual;
3. Conduct inspections at least monthly to ensure the O&M procedures are being followed and are working; and
4. Maintain records of the routine inspections and any follow-up.

B. Pretreatment Requirements

The Town of Chester does not have a pretreatment program. The permit will include standard pretreatment language.

C. Sewage Sludge Requirements

The use or disposal of sewage sludge must be in conformance with 40 CFR Part 503.

V. Public Participation

A. Public Notice

DEQ issued Public Notice No. MT-22-21 dated December 12, 2022. The public notice states that a tentative decision has been made to issue an MPDES permit to the Permittee and that a draft permit,

fact sheet and environmental assessment (EA) have been prepared. Public comments are invited any time prior to the close of the business on January 13, 2023. Comments may be directed to:

Department of Environmental Quality
Water Protection Bureau
PO Box 200901
Helena, MT 59620

or

DEQWPBPublicComments@mt.gov

All comments received or postmarked prior to the close of the public comment period will be considered in the formulation of the final permit. DEQ will respond to all substantive comments and issue a final decision within sixty days of the close of the public comment period or as soon as possible thereafter.

All persons, including the applicant, who believe any condition of a draft permit is inappropriate or that DEQ's tentative decision to deny an application, terminate a permit, or prepare a draft permit is inappropriate, shall raise all reasonably ascertainable issues and submit all reasonably available arguments supporting their position by the close of the public comment period (including any public hearing).

B. Notification of Interested Parties

Copies of the public notice were mailed to the discharger, state and federal agencies and interested persons who have expressed an interest in being notified of permit actions. A copy of the distribution list is available in the administrative record for this permit. In addition to mailing the public notice, a copy of the notice and applicable draft permit, fact sheet and EA were posted on DEQ's website for 30 days.

Any person interested in being placed on the mailing list for information regarding this MPDES permit should contact DEQ, reference this facility, and provide a name, address, and email address.

C. Public Hearing

During the public comment period provided by the notice, DEQ will accept requests for a public hearing. A request for a public hearing must be in writing and must state the nature of the issue proposed to be raised in the hearing.

D. Permit Appeal

After the close of the public comment period DEQ will issue a final permit decision. A final permit decision means a final decision to issue, deny, modify, revoke and reissue, or, terminate a permit. A permit decision is effective 30 days after the date of issuance unless a later date is specified in the decision, a stay is granted, or the applicant files an appeal.

The Applicant may file an appeal within 30 days of DEQ's action to the following address:

Secretary, Board of Environmental Review
Department of Environmental Quality
1520 East Sixth Avenue
PO Box 200901

Helena, Montana 59620-0901

E. Additional Information

Requests for additional information or questions regarding this permit should be directed to the Water Protection Bureau at 406-444-5536.

VI. Information Sources

Administrative Rules of Montana Title 17 Chapter 30 – Water Quality

Subchapter 2 - *Water Quality Permit and Application Fees.*

Subchapter 5 - *Mixing Zones in Surface and Ground Water.*

Subchapter 6 - *Montana Surface Water Quality Standards and Procedures.*

Subchapter 7- *Nondegradation of Water Quality .*

Subchapter 12 – *Montana Pollutant Discharge Elimination (MPDES) Standards.*

Subchapter 13 – *Montana Pollutant Discharge Elimination (MPDES) Permits.*

CWAIC: Clean Water Act Information Center, Department of Environmental Quality. 2017.
<http://deq.mt.gov/Water/WQPB/cwaic> . Accessed August 2017.

Damschen and Associates. 1985. *Operation and Maintenance Manual Treatment Ponds: Town of Chester EPA Project no. C300249-94.*

Montana Code Annotated (MCA), Title 75-5-101, *et seq.*, “Montana Water Quality Act.”

Montana DEQ. Circular DEQ-7, *Montana Numeric Water Quality Standards*

Montana DEQ. 2013. Lagoon Operation and Maintenance Inspection Report, Town of Chester Wastewater Treatment Facility

Oasis Environmental. 2009. Town of Chester WWTP Cottonwood Creek Stream Status Study

US Code of Federal Regulations, 40 CFR Parts 122-125, 130-133, & 136.

US Code of Federal Regulations, 40 CFR Part 503 – *Standards for the Use or Disposal of Sewage Sludge.*

Federal Water Pollution Control Act (Clean Water Act), 33 U.S.C. §§ 1251-1387, October 18, 1972, as amended 1973-1983, 1987, 1988, 1990-1992, 1994, 1995 and 1996.

USGS 2017: USGS Water Data for Montana. *Water Resources of the United States.* (August 2017)

Attachment 1. Chester WWTF Flow Schematic Diagram (from 2015 O&M Report)

